Criteria for Non-Formulary Use of Inhaled Insulin (Exubera®)

VHA Pharmacy Benefits Management Strategic Healthcare Group and the Medical Advisory Panel

These criteria were developed using the best evidence currently available. The following recommendations are dynamic and will be revised, as new clinical data become available. These guidelines are not intended to interfere with clinical judgment. Rather, they are intended to assist practitioners in providing consistent, high quality cost effective care.

Exclusion Criteria

- Patients who smoke or who have recently quit smoking within the last 6 months of starting inhaled insulin
- Known respiratory disorders or abnormal pulmonary function tests[1]
- CHF requiring pharmacologic therapy[2]

[1]Studies in patients with COPD and asthma are in progress; however, preliminary data from these trials show that the rate of non-severe pulmonary exacerbations was increased in the inhaled insulin groups versus the comparator groups

[2]These patients were excluded from the Phase 3 clinical trials

Criteria for Use

The following 2 criteria must be met:

- Provider is experienced in managing diabetic patients on insulin
- Patient must have baseline spirometry and diffusing capacity for carbon monoxide (DLCO)

AND at least 1 of the following:

- Severe persistent injection site problems such as lipohypertrophy
- Works in an environment that does not allow needles (e.g. prison guard)

Use in Patients with Needle Aversion

While not included in the criteria for use, it is appreciated that there may be exceptional circumstances where inhaled insulin may be needed for patients with psychological aversion to needles. Such a decision to use inhaled insulin must be made on a case-by-case basis. Prior to considering inhaled insulin the following is recommended:

- Patient train with a VA Diabetes Educator ± consultation with a psychologist
- Offer a trial of insulin pens, smaller gauge needles, and other assistive devices
- Patient must demonstrate and agree to self-monitoring of blood glucose

If the patient ultimately requires addition of basal insulin, conversion of pre-meal inhaled to injectable insulin should be made once the patient is stabilized on basal insulin and is comfortable with injection.

Pulmonary Function Monitoring

Baseline spirometry and diffusing capacity for carbon monoxide (DLCO) are required before beginning treatment AND within the first 6 months then annually thereafter.

In patients that have a ≥ 20% decline in FEV1 from baseline or a DLCO that declines and becomes abnormal according to the standards of the local PFT laboratory, pulmonary functions tests should be repeated. If FEV1 or DLCO abnormalities are confirmed, inhaled insulin should be discontinued.

For patients with lesser declines in FEV1 or DLCO, more frequent pulmonary function monitoring may be required and discontinuation of inhaled insulin considered.

Dosage and Administration

- **1mg blister of inhaled insulin is approximately equal to 3 units of subcutaneous regular human insulin**
- **3mg blister of inhaled insulin is approximately equal to 8 units of subcutaneous regular human insulin**
- **Three 1mg doses ≠ one 3mg dose.** It was found that Cmax and AUC of three 1mg blisters were approximately 30% and 40% higher respectively compared to one 3mg blister.
- **Three 1mg doses should not be substituted for one 3mg dose.** If the 3mg blisters become temporarily unavailable for a patients stabilized on a regimen that included the 3mg blisters, two 1mg blisters may be substituted for one 3mg blister
- Insert unit dose blister into inhaler. Pump handle of inhaler, press button to pierce blister. Insulin powder is dispersed into chamber and ready for inhalation
- Administer no more than 10 minutes prior to meals
- Patients with type 1 diabetes will still require injectable basal insulin

Initial dosing may be based on weight (actual body weight) using the guidelines in table below. Additional factors that should be taken into consideration when determining a starting dose include patient's current glycemic control, previous response to insulin, dietary and exercise habits. Further dose adjustment should be based on results of blood glucose monitoring.

Initial dosing recommendations

Patient weight	Initial dose per meal	# of 1mg blisters per dose	# of 3mg blisters per dose
30 - 39.9kg	1mg per meal	1	-
40 – 59.9 kg	2mg per meal	2	-
60 – 79.9 kg	3 mg per meal	-	1
80 – 99.9 kg	4 mg per meal	1	1
100 – 119.9kg	5 mg per meal	2	1
120-139.9 kg	6mg per meal	-	2